

Application No: 10/060,597

AMENDMENTS TO THE SPECIFICATIONIn the Specification

Please amend the specification as follows:

On page 6, please replace paragraph [0027] with the following:

[0027] When injection begins through opening (leftward shifting) of the spool valve 18, a relatively restricted flow of actuating fluid flows into the conical bore 62 forcing the ball valve 64 to its lowest disposition. The actuating fluid flows past the flow aperture 68 to bear on a relatively small portion of the actuation surface 30 of the intensifier piston 28, as indicated by arrows A, [[A']]A1. The very small incidental quantity of actuation fluid flows through the passageway 72 as indicated by the arrow [[A'']]A11. No actuation fluid flows through the annular passages 60 since the slots 88 are effectively sealed off by the piston 28 residing in the recess 84.

On page 7, please replace paragraphs [0030] through [0032] with the following:

[0030] Referring to Fig. 3, the intensifier piston 28 has continued to descend, clearing the annular lip 86 of the recess 84. This motion of the intensifier piston 28 terminates the rate shaping stage of the injection event and commences the main injection stage. At this point, the motion of the intensifier piston 28 unseals the slots 88 and the full volume actuating fluid flows through the annular passage 60 and the slots 88 to bear on the actuation surface 30 of the intensifier piston 28 as indicated by arrows B, [[B']]B1. The downward motion of the intensifier piston 28 accelerates under the influence of a substantially greater volume of high-pressure actuating fluid bearing on the actuation surface 30 to generate a substantial force on the actuation surface 30. Fuel injection through the orifices 40 ramps up very rapidly to the maximum rate of injection into the combustion chamber. It should be noted that during the main injection stage of the injection event, actuating fluid continues to flow as indicated by arrows A, [[A']]A1, and [[A'']]A11, but the greatest portion of actuation fluid being ported to the intensifier piston 28 is via the annular passage 60.

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[0031] The intensifier piston 28 continues downward to its fully extended disposition as depicted in Fig. 4. At this point, the injection event is terminated by shifting the spool valve 18 rightward, thereby closing the inlet passage 22 and opening the vent passageway 24. With the venting of the actuation fluid, pressure on the actuation surface 30 of the intensifier piston 28 decays to near zero. At this point, the return spring 34 acts upward on the intensifier piston 28 to return the intensifier piston 28 to the initial disposition against the lower margin 82 stop, as depicted in Fig. 2. The upward motion of the intensifier piston 28 is restrained by the residual actuating fluid that must be vented out the vent passageway 24. The bias exerted by the return spring 34 acts to pressurize the residual actuating fluid, shifting the ball valve 64 from its lower, open disposition to its upper, sealed disposition in contact with the seat 66 thereby closing the check valve 61. The actuation fluid flows outward opposite to the direction of flow indicated by arrows [[A'']]A11, B, and [[B'']]B1. The greatest majority of the venting actuation fluid flows initially through the slots 88 and the annular passage 60 to the vent passageway 24. As the intensifier piston 28 translates upward from the position depicted in Fig. 4 to the position depicted in Fig. 3 and thence to the position depicted in Fig. 2, the slots 88 are sealed off as the intensifier piston 28 re-enters the recess 84. As is appreciated the lip height 90 of the annulus lip 86 is selected to effect a desired amount of dampening of the intensifier piston 28 return motion, for dampening commences once the lip 86 is passed by the intensifier piston 28 and continues until the intensifier piston 28 is seated (stopped) on margin 82.

[0032] As noted above, once the slots 88 are sealed off during the upward translation of the intensifier piston 28, the damping stage begins. Since the slots 88 are sealed off and the ball valve 64 is seated against the seat 66, the only path for the venting actuation fluid is through passageway 72 opposite to the direction of flow indicated by the arrow [[A'']]A11 and through the damping orifice 74. The rate of upward translation of the intensifier piston 28 is greatly reduced by the throttling effect of the damping orifice 74. The result is that the actuation surface 30 of the intensifier piston 28 comes gently to rest in contact with the lower margin 82 of the bottom plate 54. This gentle, dampened stopping of the upward translation of the intensifier piston 28 greatly reduces the volume and intensity of noise generated by the stopping of the intensifier piston 28.